

Q1:

```
python2 pacman.py -l tinyMaze -p SearchAgent -a fn=tinyMazeSearch
```

```
[SearchAgent] using function tinyMazeSearch
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 8 in 0.0 seconds
Search nodes expanded: 0
Pacman emerges victorious! Score: 502
Average Score: 502.0
Scores:      502.0
Win Rate:    1/1 (1.00)
Record:      Win
```

```
python2 pacman.py -l tinyMaze -p SearchAgent
```

```
[SearchAgent] using function depthFirstSearch
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 10 in 0.0 seconds
Search nodes expanded: 15
Pacman emerges victorious! Score: 500
Average Score: 500.0
Scores:      500.0
Win Rate:    1/1 (1.00)
Record:      Win
```

```
python2 pacman.py -l mediumMaze -p SearchAgent
```

```
[SearchAgent] using function depthFirstSearch
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 130 in 0.0 seconds
Search nodes expanded: 146
Pacman emerges victorious! Score: 380
Average Score: 380.0
Scores:      380.0
Win Rate:    1/1 (1.00)
Record:      Win
```

```
python2 pacman.py -l bigMaze -z .5 -p SearchAgent
```

```
[SearchAgent] using function depthFirstSearch
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 210 in 0.0 seconds
Search nodes expanded: 390
Pacman emerges victorious! Score: 300
Average Score: 300.0
Scores:      300.0
Win Rate:    1/1 (1.00)
Record:      Win
```

Is the exploration order what you would have expected?

YES

Is this a least cost solution?

NO, Because the BFS total cost is 68 which is less than DFS(130).

Q2:

```
python2 pacman.py -l mediumMaze -p SearchAgent -a fn=bfs
```

```
[SearchAgent] using function bfs
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 68 in 0.0 seconds
Search nodes expanded: 269
Pacman emerges victorious! Score: 442
Average Score: 442.0
Scores:      442.0
Win Rate:    1/1 (1.00)
Record:      Win
```

```
python2 pacman.py -l bigMaze -p SearchAgent -a fn=bfs -z .5
```

```
[SearchAgent] using function bfs
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 210 in 0.0 seconds
Search nodes expanded: 620
Pacman emerges victorious! Score: 300
Average Score: 300.0
Scores:      300.0
Win Rate:    1/1 (1.00)
Record:      Win
```

Does BFS find a least cost solution?

YES

Q3:

```
python2 pacman.py -l mediumMaze -p SearchAgent -a fn=ucs
```

```
[SearchAgent] using function ucs
[SearchAgent] using problem type PositionSearchProblem
Path found with total cost of 68 in 0.0 seconds
Search nodes expanded: 269
Pacman emerges victorious! Score: 442
Average Score: 442.0
Scores:      442.0
Win Rate:    1/1 (1.00)
Record:      Win
```

```
python2 pacman.py -l mediumDottedMaze -p StayEastSearchAgent
```

```
Path found with total cost of 1 in 0.0 seconds
Search nodes expanded: 186
Pacman emerges victorious! Score: 646
Average Score: 646.0
Scores:      646.0
Win Rate:    1/1 (1.00)
Record:      Win
```

```
python2 pacman.py -l mediumScaryMaze -p StayWestSearchAgent
```

```
Path found with total cost of 68719479864 in 0.0 seconds
Search nodes expanded: 108
Pacman emerges victorious! Score: 418
Average Score: 418.0
Scores:      418.0
Win Rate:    1/1 (1.00)
Record:      Win
```

Q4:

```
python2 pacman.py -l bigMaze -z .5 -p SearchAgent -a fn=astar,heuristic=manhattanHeuristic
```

[SearchAgent] using function astar and heuristic manhattanHeuristic

[SearchAgent] using problem type PositionSearchProblem

Path found with total cost of 210 in 0.0 seconds

Search nodes expanded: 549

Pacman emerges victorious! Score: 300

Average Score: 300.0

Scores: 300.0

Win Rate: 1/1 (1.00)

Record: Win

What happens on openMaze for the various search strategies?

For astar pathcost is 54

For DFS pathcost is 298

For BFS pathcost is 54

For UCS pathcost is 54

Q5:

```
python2 pacman.py -l tinyCorners -p SearchAgent -a fn=bfs,prob=CornersProblem
```

[SearchAgent] using function bfs

[SearchAgent] using problem type CornersProblem

Path found with total cost of 28 in 0.0 seconds

Search nodes expanded: 252

Pacman emerges victorious! Score: 512

Average Score: 512.0

Scores: 512.0

Win Rate: 1/1 (1.00)

Record: Win

```
python2 pacman.py -l mediumCorners -p SearchAgent -a fn=bfs,prob=CornersProblem
```

```
[SearchAgent] using function bfs
```

```
[SearchAgent] using problem type CornersProblem
```

```
Path found with total cost of 106 in 0.0 seconds
```

```
Search nodes expanded: 1966
```

```
Pacman emerges victorious! Score: 434
```

```
Average Score: 434.0
```

```
Scores: 434.0
```

```
Win Rate: 1/1 (1.00)
```

```
Record: Win
```

Q6:

```
python2 pacman.py -l mediumCorners -p AStarCornersAgent -z 0.5
```

```
Path found with total cost of 106 in 0.0 seconds
```

```
Search nodes expanded: 692
```

```
Pacman emerges victorious! Score: 434
```

```
Average Score: 434.0
```

```
Scores: 434.0
```

```
Win Rate: 1/1 (1.00)
```

```
Record: Win
```

Q7:

```
python2 pacman.py -l testSearch -p AStarFoodSearchAgent
```

Path found with total cost of 7 in 0.0 seconds

Search nodes expanded: 14

Pacman emerges victorious! Score: 513

Average Score: 513.0

Scores: 513.0

Win Rate: 1/1 (1.00)

Record: Win

Can you solve mediumSearch in a short time?

NO